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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/615,634	07/08/2003	Barry L. Berson	SAI.P001 US	1446

32794 7590 02/13/2008
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EXAMINER	
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ART UNIT	PAPER NUMBER
2628	

MAIL DATE	DELIVERY MODE
02/13/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/615,634	BERSON ET AL.	
	Examiner	Art Unit	
	Daniel F. Hajnik	2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 November 2007*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-14,16-39 and 41-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-14,16-39 and 41-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *08 July 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

D.H.

DFH

ULKA CHAUHAN
SUPERVISORY PATENT EXAMINER

DETAILED ACTION

1. Applicant's request for reconsideration of the finality of the rejection of the last Office action is persuasive and, therefore, the finality of that action is withdrawn.

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1, 16, 17, 19, 24, 26, 29-33, 37, 38, 45, and 46 and are rejected under 35 U.S.C. 103(a) as being unpatentable over Guell et al. (US Patent 7,180,476) in view of Snyder (US Patent 6381519).

As per claim 1, Guell teaches the claimed "first sensor" and teaches the claimed "second sensor" by teaching of a plurality of imaging sensors shown in figure 2, pieces 32.

Guell teaches the claimed "detect moving objects in the images" in (col 7, lines 60-63, "With the spherical field-of-view sensor arrays, this network of aircraft greatly enhances the ability to detect and track moving targets").

Guell teaches the claimed "fuse the images to a single viewpoint" in figure 3 where the displayed viewpoint is determined by the helmet viewpoint and in the abstract, "In this way, the operator can select various views by simply looking in that direction".

Guell teaches the claimed "transform the fused image to a first viewpoint image ... and a second viewpoint" by teaching of in figure 6B where a cockpit is shown with displayed tiled

images. If a pilot and co-pilot were both sitting in the cockpit, each pilot (operator) would have a different viewpoint image from their respective positions within the cockpit where the set of tiled images is constructed from fused images from multiple sensors. Further, in Guell the viewpoint of the operator is the helmet viewpoint that each operator is wearing as shown in figure 3. Guell teaches of multiple operators, (col 4, line 14, "the pilot or other system operator") where the pilot has a first viewpoint while wearing a first helmet and a system operator has a second viewpoint while wearing a second helmet.

Guell does not teach the remaining claim limitations.

Snyder teaches the claimed "generate a third display area associated with at least two mutually exclusive windows of information on a display device for the first operator station" by teaching of (in the abstract, "the present invention allows multiple members of an aircraft crew to share control of common flight information display areas" where figure 5 shows several mutually exclusive windows of information)

Snyder teaches the claimed:

"generate a third display area associated with at least two mutually exclusive windows of information on another display device for the second operator station" by teaching of (col 3, line 33, "Helmet Mounted Displays (HMDs)" where each user, i.e. a first and second operator can each be wearing a head mounted display and col 3, lines 13-14, "user(s) 102 may interact with the data elements graphically" where graphically windows are shown in figure 6).

Snyder teaches the claimed:

"wherein the third display area can be customized independently by the operators to display detailed information related to the information displayed in at least one of in the associated windows" by teaching of (col 5, lines 37-45, "One aspect of the design of displays 304 and 306 is the ability for both pilot and copilot to access both displays from each seat, using a distinctive cursor ... for example, when the pilot is working on, for example, an en route high altitude chart on display 304, the copilot can work on the same chart on display 306, using a different range scale or type of format" and col 7, lines 5-6, "The MFDs are configured to allow the pilots to modify selected parameters displayed as a window").

It would have been obvious to one of ordinary skill in the art at the time of invention to combine Guell and Snyder in order to give more flexibility and control over the display system to each member of the crew (col 1, lines 50-54).

As per claim 16, the reasons and rationale for the rejection of claim 1 are incorporated herein in regards to the claimed receiving of images from sensors, the claimed fusing the images, and the claimed transforming the fused images to viewpoints.

Guell teaches the claimed:

"outputting the first operator viewpoint image to a first display device and the second operator viewpoint image to a second display device, wherein the display devices are positioned to provide the portion of a desired out-the window visual scene in combination with a window that provides another portion of the desired out-the-window visual scene" by teaching of

(col 5, lines 36-38, "FIG. 5B illustrates an enhanced exterior view 74 generated by the helmet-mounted display 36 and superimposed onto the image of the interior of the cockpit seen through the helmet-mounted display visor. That is, the helmet-mounted display visor is a 'see-through' type that permits light to pass through whatever image is displayed thereupon ... select regions of the helmet visor may be disabled so that a discrete area of the cockpit can be constantly monitored". In this instance, the selected disabled regions of the helmet visor display can correspond to the real world cockpit windows according to figure 5A. Further, the selected enabled region of the helmet visor display can correspond to the generated out of the window scene data according to figure 5B. Thus, if an operator, i.e. a pilot or co-pilot, were using the visor, the operator would see both the real world window in a portion and the generated scene in another portion at the same time, and each portion would correspond with the external view of the aircraft. This is further demonstrated by the reference in col 5, lines 47-52, "The benefits of being able to visualize both interior and enhanced exterior scenes in a so-called 'glass cockpit' is apparent, and primarily enables the operator to maintain awareness of the cockpit activity while observing the exterior terrain or tracking an exterior target").

Guell teaches the claimed:

"the viewpoint images are aligned with and scaled to conform to the out-the-window visual scene" by teaching of (col 6, lines 28-30, "The operator can choose to view a wide screen image with multiple tiles, or can zoom in to focus on one or two tiles" where such a zooming and displaying operations would require the use of scaling and aligning in order for the system to produce the correct output).

As per claim 17, Guell teaches the claimed limitation in (col 7, lines 60-63, "With the spherical field-of-view sensor arrays, this network of aircraft greatly enhances the ability to detect and track moving targets").

As per claim 19, Guell teaches the claimed limitations in figure 6b where it shows that the generated data as seen through the operator's head-mounted displays conforms to the out-the-window scene.

As per claim 24, this claim is similar in scope to claim 16, and thus is rejected under the same rationale.

As per claim 26, Guell teaches the claimed limitations by teaching of (col 7, lines 60-63, "With the spherical field-of-view sensor arrays, this network of aircraft greatly enhances the ability to detect and track moving targets" where these targets can be displayed on the display such as in figure 6b).

As per claim 29, Guell teaches the claimed limitations by teaching of (col 1, lines 20-24, "various systems for enhancing the vision of pilots in low visibility environments are available. Such environment include operations at nighttime, during periods of low cloud over, in stormy weather, through smoke clouds" and col 4, lines 10-12, "a plurality of sensors, such as infrared sensors, are mounted on the nose 22 of the aircraft 20").

As per claim 30, Guell teaches the claimed limitation in figure 3 where the single viewpoint image can be fused as shown in figure 6b with a plurality of sensors where the sensors create the enhanced image.

As per claim 31, Guell teaches the claimed limitation in (col 7, lines 60-63, "With the spherical field-of-view sensor arrays, this network of aircraft greatly enhances the ability to detect and track moving targets" where the system relies upon sensors for data).

As per claim 32, Guell teaches the claimed "utilize data from off-board data sources regarding the objects" in col 6, lines 8-12, "Information may be supplied to the moving map tile 88 from a global positioning system (GPS), from an eye-in-the-sky aircraft such as an AWACS plane, or from another source".

As per claim 33, Guell teaches the claimed limitations by teaching of (col 3, lines 58-62, "conventional video cameras, sonar, imaging sensors such as millimeter wave or charged couple device sensors, computer-generated images, or the like, may provide input to the system of present invention as needed").

As per claim 37, this claim is similar in scope to claim 16, and thus is rejected under the same rationale.

As per claim 38, this claim has limitations that follow those within claim 17 in terms of functionality, and thus are subject to the same reasons for rejection.

As per claim 45, Guell teaches the claimed limitations by teaching of in col 6, lines 8-12, "Information may be supplied to the moving map tile 88" and in figures 6A and 6B.

As per claim 46, Guell teaches the claimed limitations by teaching of (col 4, lines 15-18, "the sensors are mounted relatively close to the eye-level perspective of the pilot/crew member so as to achieve the effect of a second pair of eyes" and col 2, lines 58-62, "the one other separate sensor monitors an operational Parameter of the vehicle and generates a corresponding signal. For example, the operational parameter may be speed, altitude, attitude, and engine status, or other important Parameter for the respective vehicle.")

Claims 2-12, 18, 25, 27, 28, and 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guell et al. (US Patent 7,180,476) in view of Snyder (US Patent 6381519) in further view of NASA et al. (NPL Document "NASA's High-Speed Research Program", herein referred to as "NASA").

As per claim 2, Guell does not explicitly teach the claimed "combine the first and second viewpoint images with symbols". NASA teaches the claimed limitation by teaching of "pilot's ability to control and land the aircraft relying only on sensors and computer-generated images (including various symbols) on the XVS display" (2nd paragraph under the section titled "XVS

Flight Test Series I"). It would have been obvious to one of ordinary skill in the art to combine Guell, Snyder, and NASA in order to provide useful and helpful data, such as symbols, to the pilot when navigating an aircraft.

As per claim 3, Guell does not explicitly teach the claimed "detecting moving objects ... are to configured to execute simultaneously". NASA teaches the claimed limitation by teaching of multiple sensors (third paragraph under section "XVS Flight Test Series II") where these sensors would both be utilized to detect moving objects. It would have been obvious to one of ordinary skill in the art to use the claimed feature in order to provide useful and important data relating to moving aircraft to the pilot using the visualization system.

As per claim 4, Guell teaches the claimed "transforming the fused image to the first viewpoint image" and teaches the claimed "transforming the fused image to the second viewpoint image" by teaching of in figure 3 where the display image corresponds to the viewpoint as seen through the operator wearing the head mounted display. In addition, figure 6b shows the fusing of images together from each sensor. These fused images are shown in each head-mounted display for their respective viewpoint using the setup of figure 3, i.e. a first and second viewpoint for the first and second head-mounted display, respectively.

As per claim 5, Guell does not explicitly teach the claimed "symbols represent the moving objects in the vicinity of the device". NASA teaches the claimed limitation by teaching of computer-generated symbols on the display (2nd paragraph under section titled 'XVS Flight

Test Series I"). It would have been obvious to one of ordinary skill in the art to use the claimed feature in order to provide convenient and useful data to the pilot when navigating an aircraft.

As per claim 6, Guell teaches the claimed limitations in col 2, lines 58-62, "the one other separate sensor monitors an operational Parameter of the vehicle and generates a corresponding signal. For example, the operational parameter may be speed, altitude, attitude, and engine status, or other important Parameter for the respective vehicle."

As per claim 7, Guell teaches the claimed weather hazards in col 1, lines 20-24, "various systems for enhancing the vision of pilots in low visibility environments are available. Such environment include operations at nighttime, during periods of low cloud over, in stormy weather, through smoke clouds". Guell does not the claimed use of symbols to represent weather hazards. NASA teaches of computer-generated symbols on the display (2nd paragraph under section titled 'XVS Flight Test Series I"). It would have been obvious to one of ordinary skill in the art to use the claimed feature in order to provide convenient and useful data to the pilot when navigating an aircraft.

As per claim 8, Guell teaches the claimed "to receive an enhanced image from a third sensor configured to provide an image of the out-the-window scenery in low-visibility conditions" by teaching of (col 1, lines 20-24, "various systems for enhancing the vision of pilots in low visibility environments are available. Such environment include operations at nighttime, during periods of low cloud over, in stormy weather, through smoke clouds" and col 4, lines 10-

12, "a plurality of sensors, such as infrared sensors, are mounted on the nose 22 of the aircraft 20").

As per claim 9, Guell teaches the claimed limitation in figure 3 where the single viewpoint image can be fused as shown in figure 6b with a plurality of sensors.

As per claim 10, Guell teaches the claimed limitation in (col 7, lines 60-63, "With the spherical field-of-view sensor arrays, this network of aircraft greatly enhances the ability to detect and track moving targets" where the system relies upon sensors for data).

As per claim 11, Guell teaches the claimed "utilize data from off-board data sources regarding the objects" in col 6, lines 8-12, "Information may be supplied to the moving map tile 88 from a global positioning system (GPS), from an eye-in-the-sky aircraft such as an AWACS plane, or from another source".

As per claim 12, Guell teaches the claimed "wherein the first sensor and the second sensor are video cameras" by teaching of (col 3, lines 58-62, "conventional video cameras, sonar, imaging sensors such as millimeter wave or charged couple device sensors, computer-generated images, or the like, may provide input to the system of present invention as needed").

As per claims 18, 25, 27, and 28, these claims are similar in scope to claims 2, 2, 2, and 7, respectively, and thus are rejected under the same rationale.

As per claim 39, Guell teaches the claimed "primary flight information" in (col 2, lines 57-62, "Alternatively, the one other separate sensor monitors an operational Parameter of the vehicle and generates a corresponding signal. For example, the operational parameter may be speed, altitude, attitude, and engine status, or other important Parameter for the respective vehicle"). Guell does not teach the claimed symbols. NASA teaches the claimed "symbols" by teaching of "pilot's ability to control and land the aircraft relying only on sensors and computer-generated images (including various symbols) on the XVS display" (2nd paragraph under the section titled "XVS Flight Test Series I"). It would have been obvious to one of ordinary skill in the art to use the claimed feature in order to provide convenient and useful data to the pilot when navigating an aircraft.

2. Claims 13 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guell in view of Snyder in further view of NASA in further view of Bernier et al. (US Pub 2004/0169663).

As per claim 13, Guell does not explicitly teach the claimed "wherein the third sensor is a RADAR". Bernier teaches the claimed limitation by teaching of "Typical sensors used with the system are low-light video cameras, long-wave 'infrared sensors, and millimeter wave radar, to name a few" (paragraph [0050]). It would have been obvious to one of ordinary skill in the art to combine Guell, Snyder, NASA, and Bernier in order to provide better navigation capabilities to the visualization system.

As per claim 14, Guell does not explicitly teach the claimed "wherein the third sensor is a FLIR sensor". Bernier teaches the claimed limitation by teaching of "Typical sensors used with the system are low-light video cameras, long-wave 'infrared sensors, and millimeter wave radar, to name a few" (paragraph [0050]), where the long-wave infrared sensors perform a similar function to the FLIR. It would have been obvious to one of ordinary skill in the art to use the claimed feature in order to provide better navigation capabilities to the visualization system.

Claims 20-23, 34-36, 41-44, and 47 are rejected under 35 U.S.C. 103(a) as being unpatentable over Guell in view of Snyder in further view of Bernier et al. (US Pub 2004/0169663)

As per claims 20 and 21, these claims are similar in scope to both claims 13 and 14, and thus are rejected under the same rationale. It would have been obvious to one of ordinary skill in the art at the time of invention to combine Guell, Snyder, and Bernier in order to utilize a wider array of sensors to utilize with the enhanced image.

As per claim 22, Guell teaches the claimed limitations by teaching of in figure 3 where the display image corresponds to the viewpoint as seen through the operator wearing the head mounted display. In addition, figure 6b shows the fusing of images together from each sensor. These fused images are shown in each head-mounted display for their respective viewpoint, i.e. a first and second viewpoint for the first and second head-mounted display, respectively.

As per claims 23, Guell teaches the claimed "providing portions of the transformed image with data from a terrain map database" by teaching of a moving map in figure 6A and 6B.

As per claims 34 and 35, these claims are similar in scope to claims 13 and 14, and thus are rejected under the same rationale.

As per claim 36, Guell does not teach the claimed limitations. Bernier teaches the claimed limitation by teaching of in figure 16 a common window, 124 is generate from two separate image sources 122a and 122b (windows of information). Bernier in figure 18 shows that the common window can have mutually exclusive (not overlapping) windows of information, 134 and 136 and that the common window is customizable where the added windows of information 134 and 136 are customized added features. It would have been obvious to one of ordinary skill in the art to use the claimed feature in order to aid the pilot by providing important navigation data through a convenient user interface.

As per claims 41 and 42, these claims are similar in scope to both claims 13 and 14, and thus are rejected under the same rationale.

As per claim 43, Guell teaches the claimed limitations by teaching of in figure 3 where the display image corresponds to the viewpoint as seen through the operator wearing the head mounted display. In addition, figure 6b shows fusing of a plurality of images together from each sensor. These fused images are shown in each head-mounted display for their respective

viewpoint, i.e. a first and second viewpoint for the first and second head-mounted display, respectively.

As per claim 44, this claim is similar in scope to claim 32, and thus is rejected under the same rationale.

As per claim 47, this claim is similar in scope to claim 36, and thus is rejected under the same rationale.

Response to Arguments

3. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel F. Hajnik whose telephone number is (571) 272-7642. The examiner can normally be reached on Mon-Fri (8:30A-5:00P).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ulka J. Chauhan can be reached on (571) 272-7782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.